

THEORETICAL AND METHODOLOGICAL ISSUES IN THE DEVELOPMENT
OF POSITIVE AFFECT MANIPULATIONS

A Thesis

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ABSTRACT

This study examined the effectiveness and quality of two affect manipulations designed and tested for use in a study of individual creativity. Two short film clips were selected and edited to manipulate positive and neutral affect states and pre-tested. An analysis of the quality of the affect manipulations is presented as well as directions for future research.

BIOGRAPHICAL SKETCH

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PREFACE

Interest in the study of affect has been steadily increasing in organizational research (Amabile, Barsade, Mueller, & Staw, 2005). To accompany this interest, researchers have been investigating methods for studying affect in the workplace. With regard to experimental research on organizational behavior, the development of appropriate and effective affect manipulations is critical to answering some of these important questions. A topic that has not been thoroughly addressed in the research is the development and testing of affect manipulations. This paper aims to provide a thorough review of the theoretical and practical concerns associated with the design of positive affect manipulations for the testing of relevant questions. I focus on potential methodological discrepancies seen across various experimental studies as a starting point for how affect manipulations may be more effectively developed for this purpose. In addition, data from a pilot study investigating the influence of positive affect on creativity are presented as a test of the materials that were designed for this research.

AFFECT MANIPULATION: THEORETICAL AND METHODOLOGICAL CONCERNS

The term “affect” is utilized as an overarching category which covers a broad range of feelings (Barsade & Gibson, 2007; Watson & Clark, 1984). Under the category of affect, there are two general categories of feeling states that are often described in psychological and organizational research. Moods are considered more diffuse feeling states that are typically not focused on a specific stimulus (Frijda, 1986; Isen, 1984); while emotions are considered to be more intense feeling states tied to an actual stimulus (Lazarus, 1991). An important point to note with regard to the development of experimental affect manipulations is that positive and negative affect are considered to be orthogonal dimensions of affect. In other words, positive and negative affect do not exist as opposite poles on the same continuum (Ashby, Isen and Turken, 1999). Supplemental evidence suggests that happiness and sadness are in fact even mediated by independent neural pathways (Isen, 1999). What such findings mean for research on the influence of positive and negative affect on organizational behavior is that comparing the two against each other is already theoretically problematic. For example, positive consequences of positive affect on creativity do not necessarily predict negative consequences of negative affect on creativity and vice versa, and valid hypothesis testing of either affective construct should always include comparison to an appropriately designed neutral affect condition (Isen, 2001).

Reinforcing these distinctions is important to advancing research on affect and organizational behavior because it encourages detailed examination of each affective dimension independently and provides an important theoretical backdrop that may help explain conflicting results in this area of research. In fact, recent organizational research has echoed the importance of this distinction by proposing models and

studies that examine the interactive effect of both positive and negative affect at work (George & Zhou, 2007) as well as the effect of the simultaneous experience of positive and negative affect (e.g., emotional ambivalence) (Fong, 2006) on behavior within the workplace. Recognition of positive and negative affect as orthogonal dimensions is an important first step at resolving the debate on their contributions to organizational questions and the development of appropriate methods to answer them.

Equivalence of affect manipulations

While it is theoretically possible for positive and negative affect to both produce results that stimulate certain organizational behaviors in their respective contexts, some discrepancies may reveal themselves to be errors of experimental design. For instance, Isen, Daubman, and Nowicki (1987) demonstrated that positive affect facilitated creative problem solving on an insight problem, specifically the Duncker Candle Task (1945). 10 years later, Kaufmann and Vosburg (1997) found that positive affect (both naturally occurring and induced) yielded performance decrements on an almost identical insight problem. In such cases with contradictory findings, it is often revealing to examine and compare the experimental methods used across the studies. When examining the methods used to manipulate affect across studies, it should be evident that the manipulations are equivalent in that they are inducing the same affective states. In the case of these two particular studies, that condition is not so evident.¹

In the original study, Isen and colleagues utilized 5-minute film clips to induce conditions of positive and neutral affect. The positive affect clip was a montage of

¹ Neither study reported detailed information or data on pre-tests of the affect manipulations employed. This analysis of the potential differences across the studies is to emphasize the details that could potentially modify or even ruin the intended manipulations of affect and *not* a critique or analysis of the actual discrepancy in results.

previously untelevised bloopers from two old television westerns, and the neutral clip was a segment from a math film entitled “Area Under a Curve,” and the negative affect clip was from the holocaust documentary “Night and Fog (Isen et al., 1987).” Participants were instructed to watch the clips without trying to memorize anything. In contrast, Kaufmann and Vosburg (1997) utilized 10-minute film clips that included segments of the comedy “Mr. Bean” (positive affect), a documentary about the *Eise Meier* (neutral affect), and a sad scene from the film “Love Story” (negative affect).

Preliminary comparisons reveal some important differences across the manipulations: (1) length of time of clip used to induce affect (5 minutes vs. 10 minutes) and (2) differences in the anticipated familiarity with the content of the clips (untelevised segments from old television westerns vs. segments from Mr. Bean). Variance in the length of the clip used may affect the intensity of the affective experience induced. For example, shifting from mild positive affect to a longer period of engaged laughter, increases the arousal component of the induction and creates two qualitatively different manipulations (assuming control for arousal is intended or not provided). A neutral film clip that is too long can result in boredom which is also qualitatively different from the intended experience of neutral affect. For these reasons, pre-testing should be conducted to ensure appropriate arousal controls (unless arousal is part of the study in question)² and that the length of the clip does not shift the experience from mild affect to emotion (feelings associated with a specific stimulus or target).

Familiarity with the content of the clips can also create complications. If the clips are considered too strange or novel, participants may become confused. This confusion can interfere with the intended affective experience. If participants have

² It should be noted that previous studies have attempted to manipulate affect and arousal separately (affectless arousal) (Isen, 1999).

viewed the clips many times, there may be a flattened or null effect. Overexposure to an affective stimulus can render it ineffective compared to a novel one. An additional concern with using familiar film clips to induce affect is that the participant may have other unintended affective associations with the images that may interfere with or intensify the desired effect. The goal of the affect manipulation should be to produce as uniform an experience across participants as possible. Failure to consider these concerns in the design of the experiment can undermine the validity of the results. When examining the research that contributes to the positive-negative affect debate in question, it is imperative that the comparisons made be appropriately matched (and replicated) before extrapolating the results to the greater category.

Induced affect is not the only area where discrepancies about what qualifies as positive or negative affect exist. For example, one study that is regularly cited to discuss the facilitative effect of negative affect on creativity uses a measure of suicidal thoughts as a measure of negative affect (Mraz & Runco, 1994). While negative affect is certainly a salient portion of suicidal thoughts, one could argue that the employment of such a measure could also implicate other aspects of the psychological condition that could potentially have an effect on the creative performance. Equating (or suggesting equivalence of) the frequency of suicidal thoughts to the manipulations of negative affect in the laboratory is problematic. The psychological differences between the two are sufficient to suggest that the effects they produce on creativity should not be considered consequences of the same stimulus. Failure to outline these differences only further complicates the confusion over the contributions of positive and negative affect on organizational behavior.

To summarize, some basic standardization across studies via methodologically appropriate and comparable manipulations is necessary to advance the study of affect in organizational behavior. Lack of vigilance with regard to the design and

administration of affect manipulations can muddy the body of results and create discrepancies that do not replicate previous results or mislead future ones. The current study utilizes affect manipulations in a research hypothesis about the effect of positive affect on choice and creativity to examine these issues.

BACKGROUND ON POSITIVE AFFECT AND CREATIVITY

One rather well developed area of affect in organizational research is the relationship between positive affect and individual creativity and creative problem solving (Davis, 2009; Estrada, Isen, & Young, 1997; Isen, Daubman, & Nowicki, 1987). For this reason, I chose creativity as the empirical backdrop for testing the affect manipulations designed for this study. Creativity is often defined as the development of novel ideas that are useful or influential (Amabile, 1983; Runco, 2004). Over the past two to three decades, the evolution of creativity research in psychology has produced several distinct trends. Early research focused on the relationship between creativity and intelligence, specifically examining whether or not distinctions existed between the two constructs (Sternberg, 1999). Researchers interested in individual creativity also pursued case studies of highly creative individuals (e.g., William James, William Shakespeare, etc.) as a method of increasing psychological understanding of creative persons and processes (Simonton, 1999). Pertinent to organizational behavior, much creativity research has been dedicated to the examination of the relationship between environmental variables such as intrinsic motivation and creativity and creative problem solving (Amabile, 1996; Sternberg, 1991).

Empirical discoveries of the relationships between affect (both positive and negative) and cognition have produced a veritable paradigm shift from the dominance of philosophical biases that generally kept the two separate to uphold ideas of the

supremacy of emotionless rationality (Damasio, 1994). As research in this area developed, so did polarized theories on the differential influence of positive and negative affect on cognition. The resulting empirical discourse was administered by advocates for the perspective that positive affect almost unfailingly facilitates creativity as well as proponents for the creative benefits of negative affect. For the reasons listed in the theoretical review above, these results should be considered on a case by case basis as to the influence of positive and/or negative affect on the predicted result. The current study concerns the effect of positive affect and therefore this review does not specifically examine negative affect.

The influence of positive affect on creativity has been studied extensively in organizational behavior research. Positive affect has been shown to positively influence creative problem solving, creative thinking in children, creativity at work, clinical reasoning of practicing physicians, and discovery of solutions on an integrative bargaining task, among other related findings (Amabile et al., 2005; Estrada et al., 1997; Isen et al., 1987). Research on the facilitating role of positive affect in the context of individual creativity is driven by two fundamental psychological findings. The first is the influence of positive affect on cognitive flexibility, and the second is the influence of positive affect on motivation.

The finding that positive affect facilitates cognitive flexibility is generally and widely accepted (Isen, 1987; Isen, 1999). Isen (1999) has developed a theoretical framework in which positive affect is thought to facilitate creativity via increased availability of cognitive material for processing and association, flexibility in breadth of attention, as well as increased cognitive flexibility, more generally, relative to people who are in a neutral affective state. The increase in cognitive flexibility in the condition of positive affect leads to a preference for global processing compared to a

neutral or negative affective state (Frederickson, 1998).³ This fundamental finding is critical to arguments for the facilitative effects of positive affect on creativity. It should be noted that “flexibility” in this case is being used to characterize the ability to toggle between perspectives and manage information and specifically not as a condition of cognitive looseness or carelessness (Isen, 2001). The actual process of creativity has been described as the combining of disparate material in a way that is original and useful or reasonable (Isen et al., 1987; Mednick, 1962). As creativity is an integration of both novelty and usefulness, the significance of cognitive flexibility is evident to this process and presents a strong case for the facilitating role of positive affect.

The other key psychological component that outlines the positive consequences of positive affect on creativity is motivation. Positive affect has been shown to foster intrinsic motivation (Isen & Reeve, 2005) as well as components of expectancy motivation (Erez & Isen, 2002). Isen and Reeve (2005) demonstrated that participants in a positive affect condition chose to participate in an enjoyable task more often in a free choice situation and rated that activity as more enjoyable compared to participants in a neutral affect condition. Such results suggest great theoretical significance to individual creativity research due to the established contingency of creative output on the preservation of intrinsic motivation (Amabile, 1983; Amabile et al., 1996; Hennessey & Amabile, 1998). Undermining intrinsic motivation has been shown to produce decrements in creative performance in a number of tasks including: artistic creativity in adults and children, employee creativity, and scientific creativity in research and development (Amabile, 1979; Amabile et al., 1996; Amabile et al., 2005). Demonstrating positive affect’s

³ The preference for global processing does not result in decrements of local processing (Baumann & Kuhl, 2005)

facilitation of intrinsic motivation suggests the mechanism through which it stimulates creativity.

DEVELOPING AN AFFECT MANIPULATION: POSITIVE AND NEUTRAL

Two affect manipulations, one positive and one neutral, were designed for this current study. The positive affect manipulation developed for this study was a short clip excerpted from a cute children's cartoon, and the neutral affect manipulation was a short clip excerpted from an instructional DVD guide to setting up a home stereo system. The positive and neutral affect clips were each designed with the other mind so as to develop stimuli that were appropriate to use together within the same study. The overarching goal was to develop two manipulations that were comparable in almost every way save the valence of affect. In order to achieve this, the following considerations were made: time (length of clip), sound, color, general levels of activity on the screen, subject matter, and familiarity. Both clips are exactly the same length, 1 minute and 42 seconds in length a piece. Because the cartoon (positive affect manipulation) was designed with very cheerful music playing in the background, it was decided that both clips would be played without sound. Cheerful music could lend itself to higher levels of arousal which could be a potential confound. Another decision that was made was removal of color. The neutral clip in its original version was created mostly in black and white with splashes of very vivid color accents. It was assumed that the vividness of the colors would be striking enough to change the quality of the clip from neutral to positive, therefore, the clip was converted entirely to black and white. To create an appropriate companion manipulation, the positive affect clip was also shown in black and white.

The cartoon featured in the positive affect clip had no meaningful plot and it was from a program that is not shown in the United States. I purposely chose an

unfamiliar cartoon to avoid personal or emotional associations with the characters. If, for example, a participant associates the stimulus with something other than its intended purpose (positive or neutral affect), it may distort the results. To minimize this effect, I chose the foreign cartoon which would probably be less recognizable to the predominantly U.S. based sample from which most of my participants would be selected. The instructional DVD featured in the neutral affect clip was chosen for similar reasons. While the general format of the instructional film is familiar, this particular film itself was not. The subject matter and tone of the film were considered to be ordinary and commonplace enough to not produce either positive or negative affect. Both clips were animated and consisted of a moderate level of activity on-screen. In sum, the clips were designed to be nearly equivalent in all ways with the exception of positive versus neutral affective valence.

In order to test the effectiveness of the stimuli, I employed the manipulations on a study that predicted the potential buffering effect of positive affect on the demotivating effect of choice overload on individual creativity. The results of this study demonstrate that individuals under neutral affect and choice overload perform worse on a creativity task (The Remote Associates Test) compared to individuals under neutral affect and no overload. In contrast, individuals in positive affect perform equally well whether they are under choice overload or no overload. Furthermore, individuals under positive affect outperform individuals under neutral affect with no overload.

STUDY ONE

Method

Participants. Participants were 66 undergraduate students (27 women, 39 men) from a northeastern university recruited from an introductory organizational behavior course who participated in exchange for course extra credit.

Design. Subjects were assigned randomly to one of four conditions: (1) positive affect with choice overload; (2) positive affect with no choice overload; (3) neutral affect with choice overload; and (4) neutral affect with no choice overload.

Affect manipulation. Affect was induced in all four conditions of this study via a film clip that was either positively valenced (a scene from a children's cartoon) or neutral (an animated clip from an instructional DVD on how to set up a home stereo system). Both clips lasted 1 minute and 42 seconds and were shown in color, but without sound so as to avoid differences in arousal (e.g., playful music) across conditions.

Choice overload manipulation. Choice overload was induced via a selection task. Each participant is presented with a sheet of t-shirt designs. All images of the t-shirt designs are in black and white, and of the same size (2 inches by 2 inches). Participants are asked "to pick the one [t-shirt] you like the best by circling it." Individuals in the choice overload condition are presented with 24 t-shirt designs (4 rows of 6 t-shirts), and individuals in the no overload condition are presented with 6 t-shirt designs (1 row of 6 t-shirts). The number of t-shirt designs presented per condition (6 and 24) were modeled after the original study designed by Iyengar and Lepper (2000) that set up a choice between jars of jams at an upscale grocery store.

Creativity measure. Creativity is measured in this study via performance on the Remote Associates Test ("RAT") (Bowden and Jung-Beeman, 2003; Mednick, Mednick & Mednick, 1964). The RAT is a test of creativity that requires participants

to think of a single word that is related to each of the three words presented. The RAT is a validated measure of creativity that has been effectively used in numerous studies (Bowden and Jung-Beeman, 2003; Isen et al., 1987; Zhong, Dijksterhuis & Galinsky, 2008).

Procedure. Upon arriving at the laboratory, participants were each escorted into a private room with a PC laptop and a desk. Participants were told that the study focused on the consumer behavior of college-aged students. The first task, the affect manipulation, is presented as a pre-test activity designed for use in a future study. The researcher begins the film clip and leaves the room until after the activity is complete. Following completion of the film clip, participants are provided with the choice overload or no overload manipulation. Participants are given 2 minutes to choose the t-shirt they like the best from either the 6 or 24 choice sheet depending on the condition to which he or she is assigned. After the choice manipulation, each participant is presented with a 7-item version of the RAT composed of items that were of moderate difficulty (Bowden and Jung-Beeman, 2003). Each participant is given exactly 7 minutes to complete this task.

Next, subjects are asked to complete two questionnaires and a demographic form. The first questionnaire asks about the participant's attitudes about their participation in the RAT. The first questionnaire is composed of 7 items based on the interest/enjoyment subscale considered to a self-report measure of intrinsic motivation (See Appendix A). The second questionnaire asks participants to answer questions regarding their experiencing choosing t-shirts during the choice manipulation. The questions are modeled after those employed by Iyengar and Lepper (2000) (See Appendix B). The demographic form asks participants to indicate their year in college, gender, birth year, whether English is the participant's native language, hometown, and ethnicity (optional).

STUDY ONE RESULTS

Creativity. The primary test of our hypothesis was analyzed using a 2 (affect: positive vs. neutral) x 2 (choice: choice overload vs. limited choice) analysis of variance (ANOVA) which revealed no significant main effects for affect, $F(1, 62) = 1.32$, n.s., or for choice, $F(1, 62) = 3.79$, n.s., such that individual scores on the RAT were not significantly different for either group. However, because I did not predict a traditional interaction, I used planned contrasts to test our predictions directly. The planned contrasts began to reveal inconsistencies with the design of the affect manipulations. The data are shown in Figure 1 below. The positive affect condition produced the expected pattern of results, $F(1, 62) = 0.009$, n.s., such that there was no performance difference between positive affect participants under choice overload ($M = 1.40$, $SD = 1.30$) and positive affect participants under no overload ($M = 1.44$, $SD = 1.38$). The neutral affect condition did produce the predicted effect, $F(1, 62) = 7.10$, $p < 0.01$, such that individuals under neutral affect on overload ($M = 2.44$, $SD = 1.63$) outperformed individuals under neutral affect choice overload ($M = 1.18$, $SD = 1.07$). It was the comparison across the positive and neutral affect conditions that pointed to some potential irregularities with the design of the manipulations.

Within the affect conditions, the direction of the results did replicate the results found by Kim et al. (2009); however, the values of the neutral affect participants' scores created cause for concern. Firstly, there was no performance difference under the overload conditions, $F(1, 62) = .22$, n.s. Individuals in positive affect under choice overload ($M = 1.40$, $SD = 1.30$) did not outperform individuals in neutral affect under choice overload ($M = 1.17$, $SD = 1.07$). Additionally, there was a significant performance difference under the no overload conditions, $F(1, 62) = 4.53$, $p < 0.05$.

Unfortunately, for the purposes of this research, this effect was in the complete opposite direction as the one predicted such that the individuals in neutral affect under no overload ($M = 2.44$, $SD = 1.63$) significantly outperformed individuals in positive affect under no overload ($M = 1.44$, $SD = 1.38$). These unexpected findings created the need to reevaluate the quality of the affect manipulations and any unintended effects.

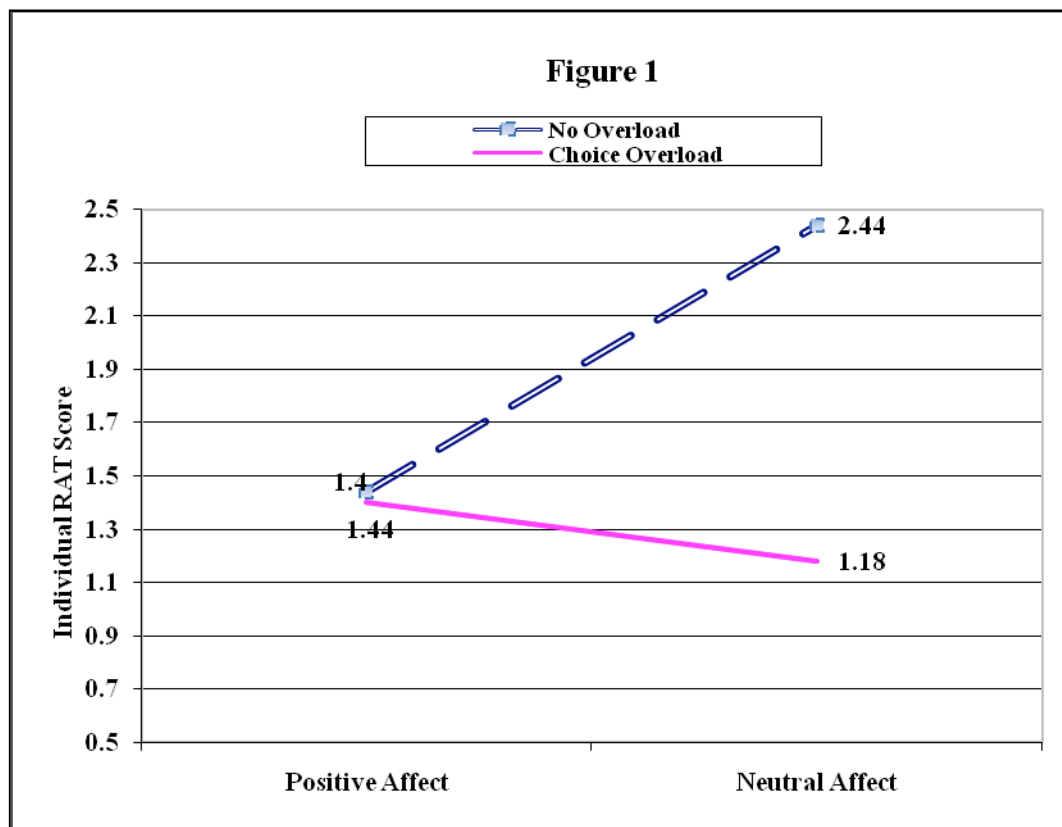


Figure 1 – Number of correct items on RAT per condition

Intrinsic motivation. I measured intrinsic motivation with items from the Interest/Enjoyment subscale of the Intrinsic Motivation Inventory. The Interest/Enjoyment subscale is comprised of 7 items that are part of a set considered to

be the self-report measure of intrinsic motivation because they most closely represent the experience of intrinsic motivation (Ryan, 1982). The Interest/Enjoyment subscale asks individuals to rate the interest and enjoyment experienced during the completion of a given task as a proxy for intrinsic motivation. Curiosity, interest, and enjoyment are the feelings associated with intrinsic motivation (Isen & Reeve, 2005). An example of a subscale item is, “This word task was fun to do.” Participants responded using a 7-point Likert scale (1 = Not at all true, 7 = Very true). The alpha for Interest/Enjoyment subscale was 0.34 (unreliable), therefore I chose to use a multivariate analysis of variance (MANOVA) to determine the results. The findings of Kim et al. (2009) showed that participants in positive affect were more intrinsically motivated than individuals in neutral affect. This study was not able to replicate this effect. The MANOVA revealed no significant differences between participants in positive affect and neutral affect $F(1, 62) = 0.45$, n.s. Again, this analysis added additional information to suggest that there was a problem with the design of one or both of the affect manipulations.

STUDY ONE DISCUSSION

The unexpected findings of this experimental replication led me to reevaluate the stimuli and search for a reason for the discrepancy. Because the results of the neutral affect condition were completely different from the predictions and results of the previous study, I felt there was reason to believe it was the source of the error. As a first step, the film clip was reviewed again for any cues as to how the intended effect (neutral affect) could be undermined. The clip showed the set up of a home entertainment center in a typical living room. The clip does not include images of any people. The set up is shown with the pieces of equipment arranging themselves in the appropriate positions in the living room on their own. In other words, the participant

watches a speaker move from one corner of the room to another by itself. Still shot examples from this film are represented in Figure 2 below. It is assumed that these actions could be considered strange or weird by the participants.



Figure 2 – Still Shots of Neutral Affect Manipulation Clip

Other aspects of the film could have undermined its original intent as a manipulation of neutral affect. For instance, the audio was removed from this clip to match the silence of the positive affect clip. The audio of the neutral clip was the

voice of the narrator explaining the equipment and why it should be moved or arranged according to the presentation on the screen. Because this audio was muted and the information not provided, it is unclear whether or not the intended purpose of the video can be gleaned. If the participants found the stimulus to be strange instead of neutral, it could have induced a different affective state or novelty. Recent research has shown that novelty produces responses similar to but not identical to positive affect (Isen & Spassova, 2008). If the film clip was considered novel (which given the content is a legitimate concern), it would certainly not make an effective neutral affect manipulation and would render the experiment an inaccurate set-up. Subsequent, ongoing research has used more effective affect manipulations and confirmed these hypotheses.

CONCLUSIONS

The testing of research questions pertinent to affect in organizations has been steadily increasing over the past three decades (Amabile et al., 2005). Designing appropriate affect manipulations for empirical questions that utilize experiments is an important part of advancing this research. Given the sensitive nature of testing said questions, it is important to outline the requirements for designing appropriate affect manipulations that reduce the potential for other confounds, such as novelty. As evidenced by the unexpected results in this pilot study, the design process involves attention to several facets of the affective experience. Additionally, creating a stimulus and a control (neutral affect manipulation) necessitates attention to creating a similar experience in terms of arousal effects, length of time, familiarity, etc. Future studies may use this pilot study as a guide for developing successful affect manipulations for use in similar research questions. The results from this research

endeavor presented here allowed me to examine and address the methodological issues which later produced the expected results in a subsequent study.

APPENDIX A

Intrinsic Motivation Inventory - Interest/Enjoyment Subscale

- A. Using the 7-point scale below, please rate the extent to which each of the following statements describes ***your thoughts while completing the word tasks.*** Read each item then mark the appropriate answer in the space next to that item.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------|---|---|------------------|---|---|-----------|
| Not true at all | | | Somewhat true | | | Very true |

- _____ 1. I enjoyed doing this word task very much.
- _____ 2. This word task was fun to do.
- _____ 3. I thought this word task was a boring activity.
- _____ 4. This word task did not hold my attention at all.
- _____ 5. I would describe this word task as very interesting.
- _____ 6. I thought this word task was quite enjoyable.
- _____ 7. While I was doing this word task, I was thinking about how much I enjoyed it.

APPENDIX B

Remote Associates Test

Instructions: For each of the following items, 3 words and a blank line will be presented. The task is to fill in a fourth word that is related to each of the 3 words provided. Please complete each puzzle before moving on to the next. If you cannot guess the answer, place an “X” on the line.

Here is an example: fish mine rush gold

Turn the page to begin.

Page 1

1) guy owl man _____

Please continue to Page 2.

Page 2

2) soul busy guard _____

Please continue to Page 3.

Page 3

3) athletes web rabbit _____

Please continue to Page 4.

Page 4

4) mower atomic foreign _____

Please continue to Page 5.

Page 5

5) widow board cat _____

Please continue to Page 6.

Page 6

6) arrow laced narrow _____

Please continue to Page 7.

Page 7

7) club gown mare _____

You have completed this puzzle.

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